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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ALI, SYED J

ART UNIT	PAPER NUMBER
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2127

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DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,414

Applicant(s)

MIKAEL ET AL.

Examiner

Syed J Ali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-32 are pending in this application.

Oath/Declaration

2. **The declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.**

The declaration is defective because it was not executed in accordance with either 37 CFR 1.66 or 1.68. Both inventors have not signed the declaration.

Claim Objections

3. **Claims 1, 4, 10, 17, 24, 27 are objected to because of the following informalities:**

- a. In line 8 of claim 1, "access one" should read "access to one", in line 8 "first priority" should read "first process", and in line 9 "second priority" should read "second process".
- b. In lines 11-12 of claim 4, "local higher" should read "higher local".
- c. In line 14 of claim 10, "than" should be deleted.
- d. In line 5 of claim 17, "local global" should read "higher global".
- e. In line 10 of claim 24, "access one" should read "access to one", in line 10 "first priority" should read "first process", and in lines 10-11 "second priority" should read "second process".

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- f. In line 12 of claim 27, "access one" should read "access to one", in line 12 "first priority" should read "first process", and in lines 12-13 "second priority" should read "second process".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 13-15 and 30-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

6. The following terms lack antecedent basis:

- a. In lines 2 and 4 of claim 13, "the corresponding process".
- b. In line 2 of claim 14, "the corresponding process".
- c. In line 2 of claim 15, "the corresponding process".
- d. In lines 2 and 4 of claim 30, "the corresponding process".
- e. In line 2 of claim 31, "the corresponding process".
- f. In line 2 of claim 32, "the corresponding process".

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Claims 1-3, 7-9, 13-18, 20-21, and 24-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Ofer et al. (USPN 6,353,869) (hereinafter Ofer).**

9. As per claim 1, Ofer teaches a method comprising:

requesting access to a shared resource for a first process having a first local priority (col. 2 line 66 - col. 3 line 19; col. 5 lines 54-63);

determining if a second process is simultaneously requesting access to the shared resource, the second process having a second local priority (col. 6 lines 36-55); and

if the second process is simultaneously requesting access to the shared resource, then granting access to one of the first process and the second process having a higher local priority (col. 6 lines 36-55).

10. As per claim 2, Ofer teaches the method of claim 1, wherein the local priority is fixed for each of the first and the second process (col. 9 line 64 - col. 10 line 1).

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11. As per claim 3, Ofer teaches the method of claim 1, additionally comprising if the second process is not simultaneously requesting access to the shared resource, then:

determining if the second process currently has a lock on the shared resource (col. 6 lines 30-55);

if the second process currently has a lock on the shared resource, then denying the first process access to the shared resource (col. 6 lines 36-55); and

if the second process does not have a lock on the shared resource, then granting the first process access to the shared resource (col. 6 lines 30-34).

12. As per claim 7, Ofer teaches a method comprising:

requesting access to a shared resource for a first process having a first global priority on a global priority queue of a global arbiter (col. 6 lines 30-55; col. 9 line 47 - col. 10 line 1);

determining if a second process is simultaneously requesting access to the shared resource, the second process having a second global priority on the global priority queue of the global arbiter (col. 6 lines 30-55; col. 9 line 47 - col. 10 line 1); and

if the second process is simultaneously requesting access to the shared resource, then granting access to one of the first process and the second process having a higher global priority (col. 6 lines 30-34; col. 9 line 47 - col. 10 line 1).

13. As per claim 8, Ofer teaches the method of claim 7, wherein the global priority queue is one of a plurality of global priority queues in the global arbiter, and each global priority queue corresponds to a given shared resource (col. 7 lines 39-65).

14. As per claim 9, Ofer teaches the method of claim 7, additionally comprising if the second process is not simultaneously requesting access to the shared resource, then:

determining if the second process currently has a lock on the shared resource (col. 6 lines 30-55);

if the second process currently has a lock on the shared resource, then denying the first process access to the shared resource (col. 6 lines 36-55); and

if the second process does not have a lock on the shared resource, then granting the first process access to the shared resource (col. 6 lines 30-34).

15. As per claim 13, Ofer teaches an apparatus comprising:

a local arbiter to arbitrate on behalf of the corresponding process for one of a plurality of resources (col. 6 lines 30-55); and

a semaphore to indicate a status of the corresponding process (col. 6 lines 44-55; col. 9 line 64 - col. 10 line 1).

16. As per claim 14, Ofer teaches the apparatus of claim 13, additionally comprising a local priority block to indicate a local priority of the corresponding process (col. 2 line 66 - col. 3 line 19; col. 5 lines 54-63).

17. As per claim 15, Ofer teaches the apparatus of claim 13, additionally comprising a timer element to determine a wait time for the corresponding process (col. 10 line 56 - col. 11 line 4; col. 13 lines 8-32).

18. As per claim 16, Ofer teaches a system comprising:

one or more shared resources (col. 2 line 66 - col. 3 line 19; col. 5 lines 54-63);

and

one or more processes, each corresponding to a semaphore system, and each semaphore system having a local arbiter to arbitrate for access to a given one of the shared resources (col. 6 lines 30-55; col. 9 line 64 - col. 10 line 1).

19. As per claim 17, Ofer teaches the system as in claim 16, wherein a given semaphore system additionally comprises a local arbiter block having a local priority corresponding to a corresponding process (col. 2 line 66 - col. 3 line 19; col. 5 lines 54-63; col. 6 lines 30-55), and the local arbiter arbitrates for access to a given one of the shared resources by granting access to the corresponding process if its corresponding process has a local global priority than a conflicting process (col. 6 lines 30-55).

20. As per claim 18, Ofer teaches the system of claim 17, wherein the local priority is fixed (col. 9 line 64 - col. 10 line 1).

21. As per claim 20, Ofer teaches the system of claim 16, wherein the local arbiter arbitrates for access to a given one of the shared resources by granting access to the corresponding process if there are no conflicting processes (col. 6 lines 30-34).

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22. As per claim 21, Ofer teaches the system as in claim 20, the system additionally comprising a global arbiter having a global priority queue, the global arbiter to:

modify process priorities by moving processes that have been granted access to a given resource to a position in the global priority queue having a lowest priority (col. 6 lines 30-55; col. 9 line 47 - col. 10 line 1); and

arbitrate conflicts between a first process and a second process by granting access to one of the first process and the second process having a having a higher global priority (col. 6 lines 30-55; col. 9 line 47 - col. 10 line 1).

23. As per claims 24-26, Ofer teaches a machine-readable medium having stored thereon data representing sequences of instructions, the sequences of instructions which, when executed by a processor, cause the processor to perform the method of claims 1-3, respectively (col. 1 lines 7-12).

24. As per claims 27-29, Ofer teaches an apparatus comprising:

at least one processor (col. 5 lines 54-63); and

a machine-readable medium having instructions encoded thereon, which when executed by the processor, are capable of directing the processor to perform the method of claims 1-3, respectively (col. 1 lines 7-12).

25. As per claim 30, Ofer teaches an apparatus comprising:

means for arbitrating on behalf of the corresponding process for one of a plurality of resources (col. 6 lines 30-55); and

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means for indicating a status of the corresponding process (col. 6 lines 44-55; col. 9 line 64 - col. 10 line 1).

26. As per claim 31, Ofer teaches the apparatus of claim 30, additionally comprising means for indicating a local priority of the corresponding process (col. 2 line 66 - col. 3 line 19; col. 5 lines 54-63).

27. As per claim 32, Ofer teaches the apparatus of claim 30, additionally comprising means for determining a wait time for the corresponding process (col. 10 line 56 - col. 11 line 4; col. 13 lines 8-32).

Claim Rejections - 35 USC § 103

28. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

29. **Claims 4-6, 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giroir et al. (USPN 4,672,536) in view of Ofer.**

30. As per claim 4, Giroir teaches a method comprising:

requesting access to a shared resource for a first process having a first wait time (col. 2 lines 22-31);

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determining if a second process is simultaneously requesting access to the shared resource, the second process having a second wait time (col. 2 lines 22-31); and

if the second process is simultaneously requesting access to the shared resource, then granting access to one of the first process and the second process having a longer wait time (col. 2 line 66 - col. 3 line 2).

31. Ofer teaches the invention as claimed, including the following limitations not shown by Giroir:

the first and second processes having a first and second local priority (col. 2 line 66 - col. 3 line 19; col. 5 lines 54-63);

if the first wait time equals the second wait time, then granting access to one of the first process and the second process having a higher local priority (col. 6 lines 36-55).

32. It would have been obvious to one of ordinary skill in the art to combine Giroir and Ofer since the method of Giroir initially sorts the waiting processes according to priority and then granting access to the process that has been waiting the longest. This brings about the issue of how to distinguish between processes if they have an equivalent wait time, in that the processes have the same priorities. Ofer provides a global queue offering global priorities to processes in addition to local priorities for processes, such that the arbiter may look to this data structure if the waiting time does not make it clear which process should be scheduled.

33. As per claim 5, Ofer teaches the method of claim 4, wherein the local priority is fixed for each of the first and second process (col. 9 line 64 - col. 10 line 1).

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34. As per claim 6, Ofer teaches the method of claim 4, additionally comprising if the second process is not simultaneously requesting access to the shared resource, then:

determining if the second process currently has a lock on the shared resource (col. 6 lines 30-55);

if the second process currently has a lock on the shared resource, then denying the first process access to the shared resource (col. 6 lines 36-55); and

if the second process does not have a lock on the shared resource, then granting the first process access to the shared resource (col. 6 lines 30-34).

35. As per claim 10, Giroir teaches a method comprising:

requesting access to a shared resource for a first process having a first wait time (col. 2 lines 22-31);

determining if a second process is simultaneously requesting access to the shared resource, the second process having a second wait time (col. 2 lines 22-31);

if the second process is simultaneously requesting access to the shared resource, then granting access to one of the first process and the second process having a longer wait time (col. 2 line 66 - col. 3 line 2).

36. Ofer teaches the invention as claimed, including the following limitations not shown by Giroir:

the first and second processes having a first global priority on a global priority queue of a global arbiter (col. 6 lines 30-55; col. 9 line 47 - col. 10 line 1); and

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if the first wait time is equal to the second wait time, then granting access to one of the first process and the second process having a higher global priority (col. 6 lines 30-34; col. 9 line 47 - col. 10 line 1).

37. As per claim 11, Ofer teaches the method of claim 10, wherein the global priority queue is one of a plurality of global priority queues in the global arbiter, and each global priority queue corresponds to a given shared resource (col. 7 lines 39-65).

38. As per claim 12, Ofer teaches the method of claim 10, additionally comprising if the second process is not simultaneously requesting access to the shared resource, then:

determining if the second process currently has a lock on the shared resource (col. 6 lines 30-55);

if the second process currently has a lock on the shared resource, then denying the first process access to the shared resource (col. 6 lines 36-55); and

if the second process does not have a lock on the shared resource, then granting the first process access to the shared resource (col. 6 lines 30-34).

39. **Claims 19 and 22-23 rejected under 35 U.S.C. 103(a) as being unpatentable over Ofer in view of Giroir.**

40. As per claim 19, Giroir teaches the system as in claim 17, wherein the given semaphore system additionally comprises a timer element, and the local arbiter arbitrates for access to a given one of the shared resource by:

granting access to the corresponding process if the corresponding process waited longer for the given resource than the conflicting process (col. 2 line 66 - col. 3 line 2).

41. Ofer teaches the invention as claimed, including if the corresponding process waited the same amount of time for the given resource as the conflicting process, then granting access to the corresponding process if the corresponding process has a higher local priority than the conflicting process (col. 6 lines 30-34; col. 9 line 47 - col. 10 line 1).

42. It would have been obvious to one of ordinary skill in the art to combine Ofer and Giroir since the method of Giroir initially sorts the waiting processes according to priority and then granting access to the process that has been waiting the longest. This brings about the issue of how to distinguish between processes if they have an equivalent wait time, in that the processes have the same priorities. Ofer provides a global queue offering global priorities to processes in addition to local priorities for processes, such that the arbiter may look to this data structure if the waiting time does not make it clear which process should be scheduled.

43. As per claim 22, Giroir teaches the system of claim 16, wherein the semaphore additionally comprises a timer element, and the local arbiter arbitrates for access to a given one of the shared resources by:

granting access to the corresponding process if the corresponding process waited longer for the given resource than a conflicting process (col. 2 line 66 - col. 3 line 2).

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44. Ofer teaches the invention as claimed, including if the corresponding process has waited the same amount of time for the given resource as the conflicting process, then offloading the arbitration process to a global arbiter (col. 6 lines 30-55; col. 9 line 47 - col. 10 line 1).

45. As per claim 23, Ofer teaches the system as in claim 22, the system additionally comprising the global arbiter having a global priority queue, the global arbiter to:

modify priorities to processes by moving processes that have been granted access to a given resource to a position in the global priority queue having a lowest priority (col. 6 lines 30-55; col. 9 line 47 - col. 10 line 1); and

arbitrate conflicts between a first process and a second process by granting access to one of the first process and the second process having a higher priority (col. 6 lines 30-55; col. 9 line 47 - col. 10 line 1).

Conclusion

46. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (571) 272-3769. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Syed Ali
October 12, 2004



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